

**REMARKS**

Claims 1-14 are pending.

**Interview**

The courtesy of the Examiner in extending an interview on October 25, 2001. The Examiner's Interview Summary correctly summarizes the interview. At the interview, a Proposed Draft Amendment was discussed. The present Amendment is a revision of that Draft Amendment in view of the discussion at the interview.

**REPLY TO OBJECTION**

Claim 1 was objected to. Claim 1 has been amended as suggested in the Office Action.

For the reasons as set forth below, the Examiner is requested to reconsider and withdraw the objection to the claim.

**REPLY TO REJECTIONS****FIRST REJECTION**

Claims 1 and 8-14 were rejected under 35 U.S.C. § 102(e) as being anticipated by Hepburn et al., (U.S. Patent No. 5,594,788 "hereinafter Hepburn '788"). This rejection is traversed.

In section 4 of the Office Action, the Patent Office details reasons why the claims were asserted to be "anticipated" by the reference to Hepburn '788.

Independent claim has been amended and does clearly distinguish over Hepburn '788.

As an explanation of base claim 1, the exhaust-purifying means has a function also of a three-way catalyst. Thus, the gas purifying means in the context claimed provides a double function. Also, in the last section of claim 1 as amended, "a substance decreasing the NO<sub>x</sub> conversion efficiency of the exhaust gas purifying means is released during operation of the control means and is converted by said function of the three-way catalyst of the exhaust purifying means" has been claimed. The substance, for example, is a sulfur component as explained in the description of Figures 4A and 4B of the drawings as set forth in the specification on page 7, lines 24-29.

As in the present claim (base claim 1), the exhaust purifying means has also a function of a three-way catalyst, while the substance decreasing the NO<sub>x</sub> conversion efficiency is released from the gas purifying means, which is converted into a harmless substance of the function of the three-way catalyst.

As the light off catalyst has HC conversion efficiency that is constant (see claim 2 explanation below) and a lower O<sub>2</sub> storage capability than the exhaust purifying means, HC is converted into a harmless substance and most of the exhaust from the engine breakthrough in the light off catalyst. Accordingly, the substance decreasing the NO<sub>x</sub> conversion efficiency is released from the gas purifying means during operation of said control means.

In Hepburn, in column 4, lines 7-12, Hepburn discloses the system design forces HC, CO, and O<sub>2</sub> breakthrough in the TWC (three-way catalyst).

Namely, the TWC of this system is designed to reduce especially HC and CO purifying efficiency to promote chemical reactions in the NO<sub>x</sub> trap (32) for creating xotherm in the trap.

Therefore, Hepburn does not have the above-function of each of the independent claims (claim 2 also discussed below) and does not solve the problem solved by the present structure. See page 3, lines 11-19.

Accordingly, claim 1 is not anticipated nor is it suggested from the reference to Hepburn.

With respect to claims 8-14, these claims are considered patentable for at least the same reasons as base claim 1.

For the reasons set forth above, the Examiner is requested to reconsider and withdraw the rejection of the claims under 35 U.S.C. § 102.

#### SECOND REJECTION

Claims 2 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hepburn et al., as applied to claim 1 above and in view of Sanbayashi et al., (U.S. Patent No. 5,349,816). This rejection is traversed.

Claim 2, which was also discussed above in the Reply to the first rejection, does distinguish over Hepburn et al. for the reasons stated above. The addition of Sanbayashi et al., U.S. Patent No. 5,349,816 does not cure the inherent deficiencies of a rejection based on Hepburn.

There is no prima facie case of obviousness established in the Office Action.

For the reasons set forth above, the Examiner is requested to reconsider and withdraw the rejection under 35 U.S.C. § 103.

### THIRD REJECTION

Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hepburn et al., as applied to claim 1 above in view of design choice.

Initially, as explained in the reply to the first rejection, the reference to Hepburn et al. does not suggest the structure claimed. The reliance on design choice is improper because the functions of what is claimed and the reference are different. See *In re Chu* 36 USPQ 2d 1089 (Fed. Cir. 1995) wherein the Court stated as follows:

Finding of "obvious design choice" precluded with a claim structure and the function it performs are different from the prior art.

The particular limitations referred to in the rejection do add to the totality of the claimed device and are more than design choice. See the importance of the structure as set forth, for example, on page 6, line 27 to page 7, line 2, and page 17, line 12 to page 18, line 9 of the specification.

Also, the citation of *In re Kuhle* (cited in the Office Action) has been considered. As the facts in that case do not parallel the facts in this case, the citation of that case does not add anything to the rejection under 35 U.S.C. §103.

need  
response

Simply  
shows  
that  
O<sub>2</sub> storage  
of TWC is  
lower than  
that of  
trap



Anticipated  
by Hepburn

Additionally, the Examiner asserts that one skilled in the art would have recognized the claim differences. See page 6, last paragraph. There is no factual basis for this speculation. It is incumbent on the Patent Office to supply facts to support a rejection under 35 U.S.C. §103. See, *In re Warner*, 154 USPQ 173, 178 (CCPA 1967) wherein the court stated as follows:

A rejection based on section 103 clearly must rest on a factual basis, and these facts must be interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation, all facts must be considered. The Patent Office has the initial duty of supplying the factual basis for its rejection. It may not, because it may doubt that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in its factual basis.

For the reasons set forth above, the Examiner is requested to reconsider and withdraw the rejection of the claims under 35 U.S.C. § 103.

#### FOURTH REJECTION

Claims 6 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hepburn et al. in view of Sanbayashi et al. as applied to claim 5 above and further in view of design choice. This rejection is traversed.

With respect to the rejection of claim 5, this was addressed in the reply to the second rejection and is incorporated herein.

With respect to the addition of "design choice," this was addressed in the reply to the third rejection supra, which is incorporated herein.

For the reasons set forth above, the Examiner is requested to reconsider and withdraw the rejections of the claims under 35 U.S.C. § 103.

ADDITIONAL PRIOR ART

Additional prior art was cited but since this art has not been applied in a rejection, no comments are considered to be necessary.

**CONCLUSION**

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Mr. Elliot Goldberg at (703) 205-8000 in the Washington, D.C. area.

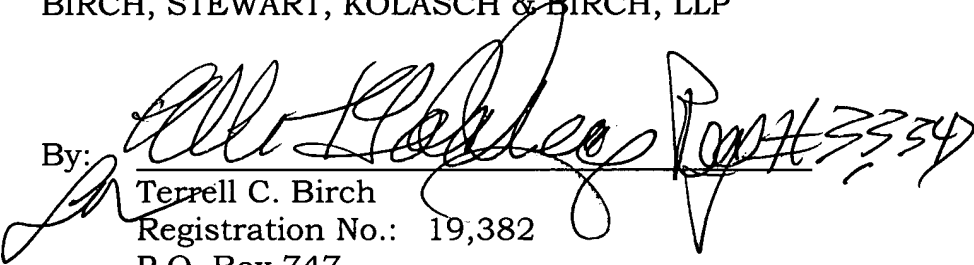
Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), the Applicants respectfully petition for a one (1) month extension of time for filing a response in connection with the present application and the required fee of \$110.00 is being filed concurrently herewith.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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TCB/EAG/kss

**VERSION WITH MARKINGS TO SHOW CHANGES MADE****IN THE CLAIMS**

Please amend the claims as follows:

1. (Twice Amended) An exhaust gas purifying apparatus of an internal combination engine, comprising:

exhaust gas purifying means, having a function of a three-way catalyst provided in an exhaust passage of the internal combustion engine, for absorbing NO<sub>x</sub> in an exhaust gas when an air-fuel ratio of the exhaust gas is lean, and means for releasing or reducing the absorbed NO<sub>x</sub> when an oxygen concentration of the exhaust gas is reduced;

a light-off catalyst provided upstream of the exhaust gas purifying means in the exhaust passage, said light off catalyst having a lower O<sub>2</sub> storage capability than said exhaust gas purifying means;

the light-off catalyst and the exhaust gas purifying means are in an exhaust passage in series so that all the exhaust gas from the engine passes through both the light-off catalyst and the exhaust gas purifying means regardless of the engine operation modes; and

control means for controlling the air/fuel ratio of the exhaust gas so that an atmosphere having a reduced oxygen concentration is produced around said exhaust gas purifying means when an NO<sub>x</sub> conversion efficiency of the exhaust gas purifying means is decreased[.] ,

wherein a substance decreasing the NO<sub>x</sub> conversion efficiency of the exhaust gas purifying means is released during operation of said control



means and is converted by said function of the three-way catalyst of the exhaust gas purifying means.

Claim 2. (Twice Amended) [The] An exhaust gas purifying apparatus [as defined in claim 1, wherein said exhaust gas purifying means includes,

an NO<sub>x</sub> catalyst that adsorbs NO<sub>x</sub> in the exhaust gas when the air/fuel ratio of the exhaust gas is lean, and releases or reduces the adsorbed NO<sub>x</sub> when the oxygen concentration of the exhaust gas is reduced, the NO<sub>x</sub> catalyst is located in the same passage and in series with the light-off catalyst, and

a three-way catalyst provided downstream of the NO<sub>x</sub> catalyst in the exhaust passage, for reducing harmful components in the exhaust gas when the air-fuel ratio of the exhaust gas is in the neighborhood of a stoichiometric ratio] of an internal combustion engine, comprising:

exhaust gas purifying means, provided in an exhaust passage of the internal combustion engine, for absorbing NO<sub>x</sub> in exhaust gas when an air-fuel ratio of the exhaust gas is lean, and means for releasing or reducing the absorbed NO<sub>x</sub> when an oxygen concentration of the exhaust gas is reduced;

a light off catalyst provided upstream of the exhaust gas purifying means in the exhaust passage, said light off catalyst having HC conversion efficiency that is constant and a lower O<sub>2</sub> storage capability than said exhaust gas purifying means;

the light off catalyst and the exhaust gas purifying means are in the exhaust passage in series so that all the exhaust gas purifying means regardless of the engine operation mode; and

control means for controlling the air-fuel ratio of the exhaust gas so that an atmosphere having a reduced oxygen concentration is produced around said exhaust gas purifying means when an NO<sub>x</sub> conversion efficiency of the exhaust gas purifying means is decreased,

wherein a substance decreasing the NO<sub>x</sub> conversion efficiency is released from the exhaust gas purifying means during operation of said control means by CO breakthrough in the light-off catalyst.